

51. (Amended) A recorded article comprising a colored portion formed on a recording medium, wherein the colored portion comprises a coloring material and fine particles and aggregates of fine particles to which the coloring material is adsorbed or bound in a monomolecular state, wherein part of the coloring material and fine particles are also present inside of the recording medium.

REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Status of the Claims

Claims 1-51 are pending in this application. Claims 1-22, 37, 38 and 40-49 have been withdrawn from consideration. Thus, Claims 23-27, 33-36, 39, 50 and 51 are the independent claims that are presently under consideration. Claims 24-27, 34-36, 39, 50 and 51 are amended herein to more clearly recite the features of the invention, without narrowing their scope. It is submitted that no new matter has been added by the amendments herein.

Affirmation of Election of Group I Claims

The Examiner has imposed a Restriction Requirement among:

Group I, Claims 1-19 and 40-49, drawn to an image forming method and a surface treating method;

Group II, Claims 20-22, drawn to an ink set;

Group III, Claims 37-38, drawn to an ink set; and

Group IV, Claims 23-36, 39 and 50-51, drawn to an ink-jet recorded image, recorded article and surface treated article.

Applicants affirm their previous election of Group IV (Claims 23-36, 39 and 50-51), with traverse.

It is respectfully submitted that all of the claims could be searched by one Examiner without undue effort. It is also respectfully submitted that it is not mandatory to make a restriction requirement in every possible situation.

It is believed that if one Examiner acts on all of the claims of the present application at one time, overall examining time will be less than if two or more Examiners are involved. It is also earnestly believed that the examination of all of the claims at one time by one examiner in the present application will best ensure uniform prosecution quality. Therefore, in the interest of prosecution economy of time and quality for both the Office and Applicants, it is respectfully submitted that

withdrawal of the Restriction Requirement in this application and examination of all pending claims on their merits are appropriate and such action is respectfully solicited.

Copies of References Cited in July 11, 2001
Information Disclosure Statement

In a telephone call explaining the Office Action, the Examiner stated that none of the copies of the documents were received with the July 11, 2001 Information Disclosure Statement. Applicants are enclosing herewith, under separate cover, another copy of each of these references, and the European Search Report referencing some of them, together with a photocopy of the postcard receipt for the July 11, 2001 Information Disclosure Statement, bearing the PTO's date stamp indicating receipt of all 32 documents cited in that Information Disclosure Statement. It is respectfully requested that these documents be considered by the Examiner and that the PTO-1449 forms submitted with the July 11, 2001 Information Disclosure Statement be initialed and returned indicating that the documents have been considered.

Section 112 Rejections

Claims 23-36, 39, 50 and 51 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. Regarding Claim 23, the Examiner states that it is not clear what

the letters "CIE" mean. "CIE" is an abbreviation for Commission Internationale de l'Eclairage. A copy of a web page explaining this system is attached. It is submitted that a person skilled in the art would understand the "CIE" designation, and that the claim terminology is clear. Regarding the other claims, Claims 24-27, 34-36, 39 and 50-51 have been amended to improve their form. Applicants submit that the present claims comply with all aspects of Section 112, and respectfully request withdrawal of the Section 112 rejections. If the Examiner believes that any Section 112 issues remain, she is invited to telephone Applicants' undersigned attorney so that mutually acceptable claim language may be agreed upon.

Sections 102 and 103 Rejections

Claims 25, 30-33, 36, 39, 50 and 51 were rejected under 35 U.S.C. § 102(e) as allegedly anticipated by EP 900 831 A2 ("Miyabayashi"). Claims 23, 24, 26, 27, 34 and 35 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Miyabayashi. Claims 28 and 29 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Miyabayashi in view of EP 776 950 A2 ("Shimomura et al."). Applicants respectfully disagree with these rejections.

Before addressing the merits of the rejections, Applicants believe it will be helpful to review some features and advantages of the present invention. An object of the present invention is to improve the density and color intensity of images without spoiling the texture of a recording material, and at the same time to alleviate the occurrence of white stripes in the image.

Conventional methods using an ink and a treating liquid reactive with the ink to obtain high image density and color intensity present a problem: due to excessively high reactivity of the ink and the treating liquid, agglomeration of coloring material may cause reduction of the color intensity, or white stripes may appear in the image portion thus deteriorating the image quality. In response to these problems, Applicants have found that if the reaction of the two liquid system is weakened to prevent agglomeration of the coloring material, and the coloring material contained in the ink is adsorbed in a monomolecular state onto fine particles contained in the treating liquid, these problems are solved.

Thus, one feature of the present invention is that the coloring material contained in the ink is adsorbed in a monomolecular state onto the surface of fine particles contained in the treating liquid, whereby high image density and high color

saturation are achieved. Another feature is that the coloring material runs slightly into the recording material.

In Applicants' view, the cited references do not teach or suggest the claimed invention.

The Examiner takes the position that Miyabayashi discloses an ink jet recorded image on a recorded sheet comprising colored image and fine particles which are in contact with the surface of the recording medium wherein the fine particles have a colorant, comprising a dye and solvent component, adsorbed into the fine particles (monomolecular state), or that the colorant is adsorbed and fixed to the fine particles when it is dispersed in the ink composition (monomolecular state). Applicants respectfully disagree.

Miyabayashi discloses an ink containing fine polymer particles having a metal-chelating activity to form an image having improved rubbing/scratch resistance. The fine particles form chelates with metal ions present on the surface of the recording medium to agglomerate and remain on the surface and later to form a film. As described at page 5, lines 6-7, when the colorant is a dye, the dye is penetrated into the recording medium to some extent and is fixed onto the recording medium. Provision of a layer of the fine particles on the recording medium is said to result in improved rubbing/scratch resistance.

Also, at page 5, lines 46-48, Miyabayashi states that when the colorant is a dye, a part of the dye penetrates into the recording medium and the fine particles of the polymer are left on the surface of the recording medium while incorporating a part of the dye, thereby forming a film. Applicants note that, therefore, the dye that is present near the fine particles is taken in the polymer agglomerates, not absorbed onto fine particles in a monomolecular state. Applicants further note that Miyabayashi does not teach or suggest that the adsorbed coloring material is in a monomolecular state.

Moreover, in Miyabayashi, the fine particles and the colorant are present in the same ink composition. In Applicants' view, this does not teach or suggest that the colorant is substantially adsorbed by the fine particles, nor does it teach or suggest that the colorant-particle agglomerate is present in a monomolecular state.

Applicants therefore conclude that Miyabayashi does not address the technical problems to be solved by the present invention or disclose the effect of the present invention; nor does it teach or suggest adsorption of the coloring material in a monomolecular state onto the surface of the fine particles and/or particle aggregates. Accordingly, the present invention is not anticipated by or obvious over Miyabayashi.

Shimomura et al. discloses a recording ink containing an anionic colorant and a water-soluble nonionic polymeric compound having an alicyclic, nitrogen-containing heterocycle. The polymeric compound accelerates the insolubilization of the ink forming aggregates in contact with a cationic liquid composition. In Applicants' view, Shimomura et al. does not remedy the deficiencies of the Miyabayashi reference noted above.

Accordingly, Applicants conclude that neither of the cited references, whether taken alone or in combination, teaches or suggests all of the features of the present invention as recited in the independent claims. Thus, Applicants request withdrawal of the rejections under Sections 102 and 103.

Conclusion

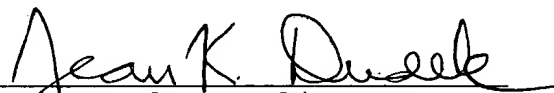
Applicants submit that the present invention is patentably defined by the independent claims. The dependent claims are allowable for the same reasons as their respective independent claims, as well as for the patentable features recited therein. Individual consideration of the dependent claims is respectfully solicited.

Applicants believe that the present Amendment is responsive to each of the points raised by the Examiner in the Office Action, and submit that the application is in allowable

form. Favorable consideration of the claims, rejoinder of Claims 1-22, 37, 38 and 40-49 and passage to issue of the present application at the Examiner's earliest convenience earnestly are solicited.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our address given below.

Respectfully submitted,


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Attachment: Technical Guide Webpage (CIELAB)

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

24. (Amended) An ink-jet recorded image comprising [having] a colored portion formed on a recording medium, wherein the colored portion is formed with [contains colored] fine particles or aggregates thereof and [wherein] a coloring material [has been] adsorbed on a surface [to at least one] of the fine particles or aggregates thereof in a monomolecular state [on particle surfaces].

25. (Amended) An ink-jet recorded image, comprising [characterized in that a constituent of] a coloring material and fine particles provided on a recording medium, wherein the [in a recording medium is in [site comes into] direct contact with [a] part of [the surfaces of at least one of] fine particles and aggregates thereof, and part of the [fine particles at the surface of the constituent, and a] coloring material is adsorbed in a monomolecular state onto a surface [on the surface of at least one] of the fine particles and [fine particle] aggregates thereof.

26. (Amended) An [A] ink-jet recorded image formed on [by] a recording medium, the image comprising a coloring material and fine particles reactive with [to] the coloring material provided on a coloring medium, wherein [a main image forming part is formed by] aggregates of the fine particles having [of which surfaces have adsorbed] the coloring material thereon by adsorption in a monomolecular state are forming a main portion of the image, and the main portion has a feathering portion [of an ink is] formed with the coloring material in [at] a peripheral part thereof [of the main image part].

27. (Amended) An [A] ink-jet recorded image formed on a recording medium comprising [by] a coloring material and fine particles reactive with [to] the coloring material, wherein a ratio of the coloring material to [is present more than] the fine particles is larger in [at] a peripheral portion [part] of the image than in a main portion of the image [forming part of a colored portion].

34. (Amended) A recorded article comprising at least one of fine particles and aggregates of fine particles [particle], on the surfaces of which a coloring material has been adsorbed in a monomolecular state, said fine particles or

aggregates being present on the surface of a recording medium in the form of an aggregate mass [partially] containing voids.

35. (Amended) A recorded article having an image comprising a colored portion on a recording medium, wherein the colored portion includes a first region [mainly] containing at least one of fine particles and aggregates of fine particles, on the surfaces of which a coloring material has been adsorbed in a monomolecular state, and a second region located outside the first region and [mainly] containing the coloring material.

36. (Amended) A recorded article comprising, on the surface of a recording medium, a recorded portion containing at least one of fine particles and aggregates of fine particles [particle], on the surfaces of which a recording agent has been adsorbed in a monomolecular state.

39. (Amended) A surface-treated article wherein [characterized in that] the surface of the article has at least one of fine particles and aggregates of fine particles [particle], the surfaces of the particles having a functional substance that has been adsorbed in a monomolecular state.

50. (Amended) A recorded article having a colored portion formed on a recording medium, the colored portion containing at least one of fine particles and aggregates of fine particles [particle], on the surfaces of which a coloring material has been adsorbed in a monomolecular state, wherein at least one of the coloring material and the fine particles has penetrated into an inside of the recording medium.

51. (Amended) A recorded article comprising a colored portion formed on a recording medium, wherein the colored portion comprises a coloring material and [containing at least one of] fine particles and aggregates of fine particles [particle] to [on the surfaces of] which the [a] coloring material is [has been] adsorbed or bound in a monomolecular state, wherein part of the coloring material and [the] fine particles are also present [has penetrated into the] inside of the recording medium[, and at least part of the penetrated coloring material is adsorbed or bonded to the penetrated fine particles in a monomolecular state].